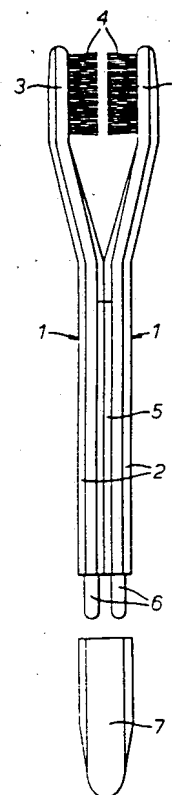




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>5</sup> :</b>  <b>A46B 9/04, 5/00</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 93/13691</b>  <b>(43) International Publication Date:</b> 22 July 1993 (22.07.93)
<b>(21) International Application Number:</b> PCT/GB92/02366 <b>(22) International Filing Date:</b> 21 December 1992 (21.12.92)  <b>(30) Priority data:</b> 9200154.4 6 January 1992 (06.01.92) GB  <b>(71)(72) Applicant and Inventor:</b> CHUNG, Angelika, Yuk, Bing [GB/GB]: Flat B2, Second Floor, Wisdom Court, 5 Hatton Road, Hong Kong (HK).  <b>(74) Agent:</b> GILL JENNINGS & EVERY: Broadgate House, 7 Eldon Street, London EC2M 7LH (GB).  <b>(81) Designated States:</b> CA, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).		<b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> A TOOTHBRUSH  <b>(57) Abstract</b> <p>A toothbrush split axially into two halves (1) which are hinged together along their length. The toothbrush can be used in a first position as a conventional toothbrush and can be pivoted to a second position wherein the bristles (4) on the heads (3) extend towards one another.</p>		



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A TOOTHBRUSH

The present invention relates to a toothbrush of the kind having a pair of heads capable of cleaning two sides  
5 of a tooth simultaneously.

Toothbrushes are known which have two fixed heads which face one another and from which bristles extend towards those of the other head. These toothbrushes have two disadvantages. Firstly, they have a fixed gap between  
10 the bristles so that different thicknesses of teeth can not be uniformly cleaned. Secondly, the twin heads make the end of the toothbrush far more bulky than a conventional toothbrush and thus it is difficult to clean one side of a tooth alone.

According to the present invention, a toothbrush  
15 comprises two halves, each consisting of an elongate handle with, at one end a head carrying bristles, the two halves being hinged together about an axis extending substantially parallel to the lengths of the handles; whereby the two  
20 halves can be pivoted between a first position in which the heads lie closely side by side with the bristles extending in substantially the same direction, and a second position in which the heads are spaced apart with the bristles of each head extending towards those of the other head.

25 With this arrangement, the toothbrush can be used in a first position as a conventional toothbrush and in a second position in which the brush can be used to clean two sides of the tooth simultaneously.

The two halves are preferably hinged together using a  
30 film hinge.

The two halves of the toothbrush may be held in the first position by a sheath removably fitted over the handles. Preferably, the end of each half remote from the head is provided with a respective peg positioned such that  
35 the spacing between the pegs is the same in the first and second positions; whereby the toothbrush can be held in the first and second positions by a retainer having two sockets

which are complimentary to the pegs in the first and second positions. This prevents the toothbrush from accidentally rotating into the second position during use.

5 An example of a toothbrush constructed in accordance with the present invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a plan view of the toothbrush and retainer in the first position with the retainer detached;

10 Figure 1A and 1B are end views of the toothbrush and retainer respectively with the toothbrush in the first position;

Figure 2 is an enlarged section along line A-A in Figure 1;

15 Figure 3 is a plan view of the toothbrush and retainer in the second position with the retainer detached;

Figures 3A and 3B are end views of the toothbrush and retainer respectively with the toothbrush in the second position;

20 Figures 4 and 5 show the toothbrush in use in the first position; and,

Figures 6 and 7 show the toothbrush in use in the second position.

25 The toothbrush shown in Figures 1 to 3 comprises two symmetrical halves 1 each having a handle 2 with a head 3 at one end. Bristles 4 extend perpendicularly from the heads 3.

The two halves 1 are joined by a film hinge 5 attached to the top surface and along the length of the handle as shown in Figures 1 and 2.

30 In the first position, the heads 3 of the two halves 1 lie side by side, with the bristles 4 of both halves being parallel. The toothbrush may be used in this position as shown in Figures 4 and 5 as a conventional toothbrush.

35 If it is desired to simultaneously clean two surfaces of a tooth, the toothbrush can be easily manipulated into the second position. The two halves 1 of the toothbrush

are rotated about the flap hinge into the position shown in Figure 3. The heads 3 face each other and the bristles 4 extend into the gap between the heads. It can be used to brush teeth in the manner shown in Figures 6 and 7.

5       The end of each half 1 is provided with a peg 6. The positioning of the pegs 6 is such that in the first and second position, the distance between the pegs is the same.

10       A retainer 7 is provided with two sockets which are complimentary to the pegs and can be fitted over the pegs in the first and second positions. The retainer 7 is press fitted onto the pegs 6 in order to hold the toothbrush in one position. It has to be removed before moving the toothbrush to the other position whereupon it can be replaced to hold the toothbrush in the second position.

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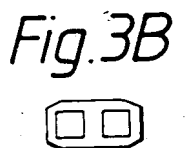
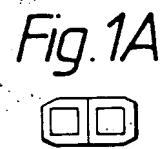
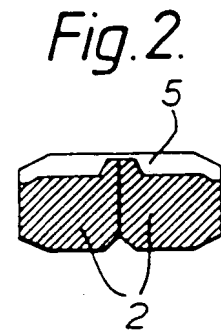
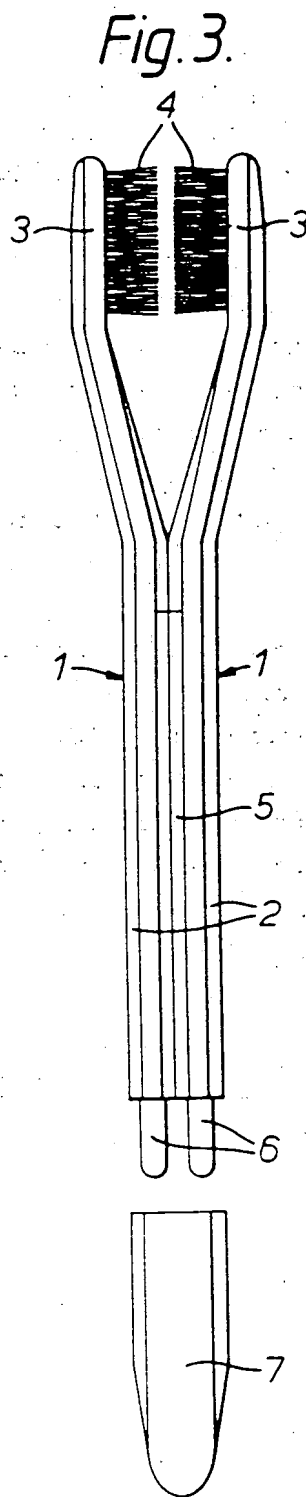
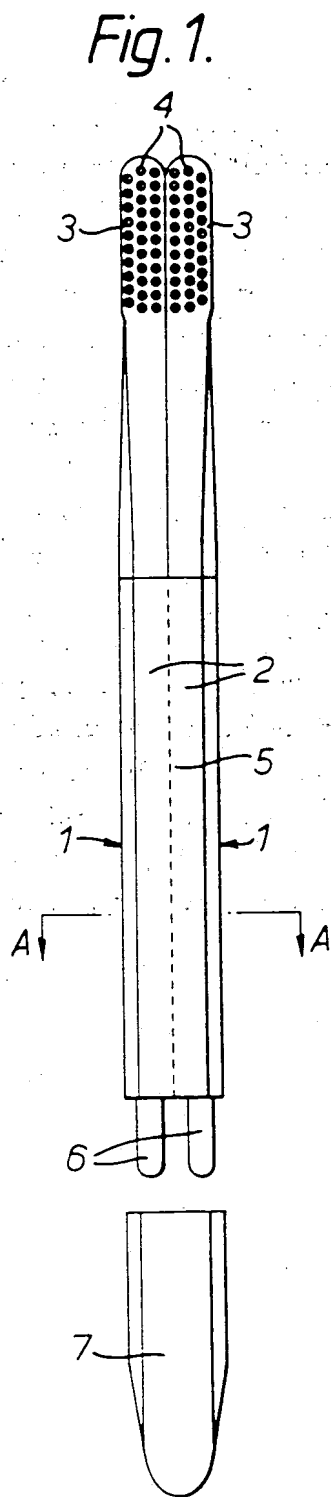
CLAIMS

1. A toothbrush comprising two halves (1), each  
consisting of an elongate handle (2) with, at one end a  
5 head (3) carrying bristles (4), the two halves being hinged  
together about an axis extending substantially parallel to  
the lengths of the handles; whereby the two halves can be  
pivoted between a first position in which the heads lie  
closely side by side with the bristles extending in  
10 substantially the same direction, and a second position in  
which the heads are spaced apart with the bristles of each  
head extending towards those of the other head.

2. A toothbrush according to claim 1, wherein the two  
15 halves are hinged together using a film hinge (5).

3. A toothbrush according to claim 1 or claim 2, wherein  
the end of each half remote from the head is provided with  
a respective peg (6) positioned such that the spacing  
20 between the pegs is the same in the first and second  
positions; whereby the toothbrush can be held in the first  
and second positions by a retainer (7) having two sockets  
which are complimentary to the pegs in the first and second  
positions.

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Fig. 4.

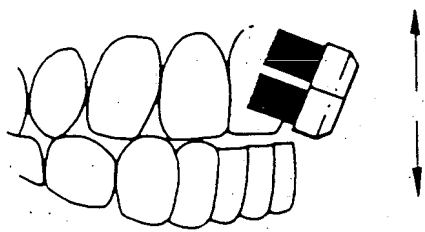


Fig. 5.

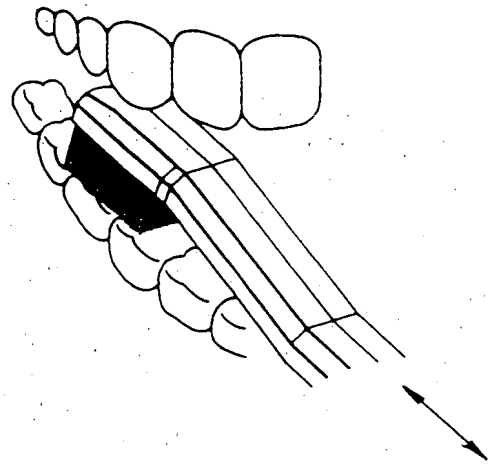


Fig. 6.

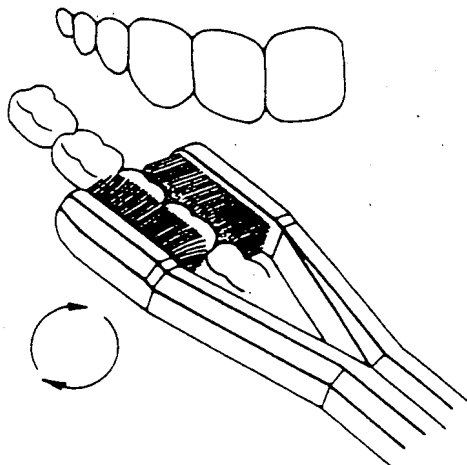
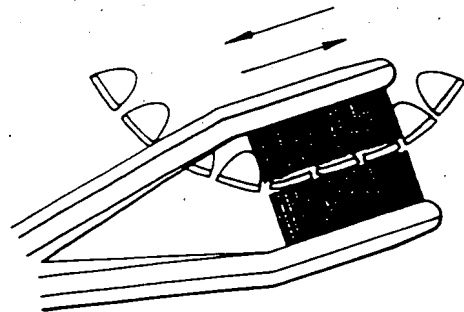


Fig. 7.



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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 92/02366

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup> According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. 5 A46B9/04;                      A46B5/00																				
<b>II. FIELDS SEARCHED</b> <div style="text-align: right; font-size: small;">Minimum Documentation Searched<sup>7</sup></div> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border: none; text-align: center; font-size: small;">Classification System</td> <td style="border: none; text-align: center; font-size: small;">Classification Symbols</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">Int.Cl. 5</td> <td style="border: 1px solid black; padding: 5px;">A46B</td> </tr> </table> <div style="text-align: center; font-size: small; margin-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched<sup>8</sup></div>			Classification System	Classification Symbols	Int.Cl. 5	A46B														
Classification System	Classification Symbols																			
Int.Cl. 5	A46B																			
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th style="width: 10%;">Category<sup>10</sup></th> <th style="width: 70%;">Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages<sup>12</sup></th> <th style="width: 20%;">Relevant to Claim No.<sup>13</sup></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td>GB,A,2 192 784 (CHAI-LEUNG MAK) 27 January 1988 see page 1, line 53 - page 2, line 6; figures</td> <td style="text-align: center; vertical-align: top;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td>CH,A,535 026 (NILS ARNE ERKERS) 31 March 1973 see claims; figures</td> <td style="text-align: center; vertical-align: top;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>FR,A,659 502 (NOEL) 29 June 1929 see figures</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>DE,A,3 415 735 (SCHAWALDER) 31 October 1985 see page 5, line 1 - page 6, line 15; figures</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> <tr> <td colspan="3" style="text-align: center; padding-top: 10px;">-/--</td> </tr> </tbody> </table>			Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>	Y	GB,A,2 192 784 (CHAI-LEUNG MAK) 27 January 1988 see page 1, line 53 - page 2, line 6; figures	1-3	Y	CH,A,535 026 (NILS ARNE ERKERS) 31 March 1973 see claims; figures	1-3	A	FR,A,659 502 (NOEL) 29 June 1929 see figures	1	A	DE,A,3 415 735 (SCHAWALDER) 31 October 1985 see page 5, line 1 - page 6, line 15; figures	1	-/--		
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<div style="display: flex; justify-content: space-between; font-size: x-small;"> <div style="width: 45%;"> <p><sup>10</sup> Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>																				
<b>IV. CERTIFICATION</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Date of the Actual Completion of the International Search</b>  <div style="text-align: center; font-weight: bold;">16 MARCH 1993</div> </div> <div style="border: 1px solid black; padding: 5px;"> <b>International Searching Authority</b>  <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> </div> </td> <td style="width: 50%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Date of Mailing of this International Search Report</b>  <div style="text-align: center; font-weight: bold; font-size: 1.2em;">24. 03. 93</div> </div> <div style="border: 1px solid black; padding: 5px;"> <b>Signature of Authorized Officer</b>  <div style="text-align: center; font-weight: bold;">ERNST R.T.</div> </div> </td> </tr> </table>			<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Date of the Actual Completion of the International Search</b>  <div style="text-align: center; font-weight: bold;">16 MARCH 1993</div> </div> <div style="border: 1px solid black; padding: 5px;"> <b>International Searching Authority</b>  <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Date of Mailing of this International Search Report</b>  <div style="text-align: center; font-weight: bold; font-size: 1.2em;">24. 03. 93</div> </div> <div style="border: 1px solid black; padding: 5px;"> <b>Signature of Authorized Officer</b>  <div style="text-align: center; font-weight: bold;">ERNST R.T.</div> </div>																
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## III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	WO, A, 9 001 281 (KLINKHAMMER) 22 February 1990 see figures -----	1

# ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 9202366  
SA 67866

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
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16/03/93

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A-2192784	27-01-88	None	
CH-A-535026	31-03-73	None	
FR-A-659502		None	
DE-A-3415735	31-10-85	None	
WO-A-9001281	22-02-90	AU-A- 3060989	11-08-89
		EP-A- 0398976	28-11-90
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